SF Series Additive Feeders

Part Number: 882.00274.00
Bulletin Number: BF2-605
Effective: 10/31/05

Write Down Your Serial Numbers Here For Future Reference:

_____ _____

_____ _____

_____ _____

We are committed to a continuing program of product improvement.
Specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. _____

Please note that our address and phone information has changed. Please reference this page for updated contact information.

⚠CAUTION These manuals are obsolete and are provided only for their technical information, data and capacities. Portions of these manuals detailing procedures or precautions in the operation, inspection, maintenance and repair of the products may be inadequate, inaccurate, and/or incomplete and shouldn't be relied upon. Please contact the ACS Group for more current information about these manuals and their warnings and precautions.

Parts and Service Department

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

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Shipping Information

Unpacking and Inspection

You should inspect your additive feeder for possible shipping damage.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage.

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on it. You should have:

- ☑ Additive Feeder
- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the shipping department immediately**. For shipments in the United States and Canada, call **1 (800) 233-4819**; for all other countries, call our international desk at **(630) 475-7491**. Have the order number and item number available. *Hold the items until you receive shipping instructions.*

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

Table of Contents

Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your additive feeder. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the additive feeder. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the additive feeder. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the additive feeder safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your additive feeder provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, parts lists, and available options. A spare parts list with part numbers specific to your machine is provided with your shipping paperwork package. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

DANGER! ***DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.***

WARNING! ***WARNING indicates a potentially hazardous situation or practice that, if not avoided, could result in death or serious injury.***

Caution! ***CAUTION indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.***

1-2 Warnings and Precautions

Our equipment is designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes. This may include, but is not limited to OSHA, NEC, CSA, SPI, and any other local, national and international regulations.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

- ☑ **Read and follow these operation and installation instructions when installing, operating, and maintaining this equipment. If these instructions become damaged or unreadable, additional copies are available from the manufacturer.**
- ☑ Follow all **SAFETY CODES**.
- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.
- ☑ Work only with approved tools and devices.
- ☑ Disconnect and/or lock out power before servicing or maintaining the equipment.
- ☑ Use care when **LOADING**, **UNLOADING**, **RIGGING**, or **MOVING** this equipment.
- ☑ Operate this equipment within design specifications.
- ☑ **DO NOT** use the additive feeder in an explosive atmosphere.
- ☑ **DO NOT** use additive feeder outdoors or in wet environments. Moisture will damage the motor and can create an electric shock hazard.
- ☑ **OPEN**, **TAG**, and **LOCK ALL DISCONNECTS** before working on equipment. You should remove the fuses and carry them with you.
- ☑ Make sure the equipment and components are properly **GROUNDED** before you switch on power.
- ☑ Use **EXTEREME CAUTION** when working with additive feeder. **NEVER** put hands or tools in or near the auger assembly when power is connected.
- ☑ When welding or brazing in or around this equipment, make sure **VENTILATION** is **ADEQUATE**. **PROTECT** adjacent materials from flame or sparks by shielding with sheet metal. An approved **FIRE EXTINGUISHER** should be close at hand and ready for use if needed.
- ☑ Do not restore power until you remove all tools, test equipment, etc., and the equipment and related components are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.

1-3 Responsibility

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

General Responsibility

No mater who you are, safety is important. Owners, operators and maintenance personnel must realize that every day, safety is a vital part of their jobs.

If your main concern is loss of productivity, remember that production is always affected in a negative way following an accident. The following are some of the ways that accidents can affect your production:

- Loss of a skilled operator (temporarily or permanently)
- Breakdown of shop morale
- Costly damage to equipment
- Downtime

An effective safety program is responsible and economically sound.

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.

Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the equipment and intimately knows its capabilities and limitations.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward machinery formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

Learn and always use safe operation procedures. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

REMEMBER:

- **NEVER** place your hands or any part of your body in any dangerous location.
- **NEVER** operate, service, or adjust the feeder without appropriate training and first reading and understanding this manual.
- **NEVER** try to pull material out of the feeder with your hands while it is running!
- Before you start the feeder check the following:
    - Remove all tools from the feeder;
    - Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the hopper area;
- If your feeder has been inoperative or unattended, check all settings before starting the unit.
- At the beginning of your shift and after breaks, verify that the controls and other auxiliary equipment are functioning properly.
- Keep all safety guards in place and in good repair. **NEVER** attempt to bypass, modify, or remove safety guards. Such alteration is not only unsafe, but will void the warranty on your equipment.
- When changing control settings to perform a different mode of operation, be sure selector switches are correctly positioned. Locking selector switches should only be adjusted by authorized personnel and the keys removed after setting.
- Report the following occurrences **IMMEDIATELY:**
    - unsafe operation or condition
    - unusual feeder action
    - leakage
    - improper maintenance
    - **NEVER** stand or sit where you could slip or stumble into the feeder while working on it.
- **DO NOT** wear loose clothing or jewelry, which can be caught while working on a feeder. In addition, cover or tie back long hair.

- Clean the feeder and surrounding area **DAILY**, and inspect the machine for loose, missing or broken parts.
- Shut off power to the feeder when it is not in use. Turn the switch to the **OFF** position, or unplug it from the power source.

Maintenance Responsibility

Proper maintenance is essential to safety. If you are a maintenance worker, you must make safety a priority to effectively repair and maintain equipment.

Before removing, adjusting, or replacing parts on a machine, remember to turn off all electric supplies and all accessory equipment at the machine, and disconnect and lockout electrical power. Attach warning tags to the disconnect switch.

When you need to perform maintenance or repair work on equipment above floor level, use a solid platform or a hydraulic elevator. If there is a permanently installed catwalk on your equipment, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on equipment, machines, or work from ladders.

If you need to repair a large component, use appropriate handling equipment. Before you use handling equipment (portable "A" frames, electric boom trucks, fork trucks, overhead cranes) be sure the load does not exceed the capacity of the handling equipment or cause it to become unstable.

Carefully test the condition of lifting cables, chains, ropes, slings, and hooks before using them to lift a load.

Be sure that all non-current carrying parts are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes.

When you have completed the repair or maintenance procedure, check your work and remove your tools, rigging, and handling equipment.

Do not restore power to the equipment until all persons are clear of the area. **DO NOT** start and run the machine until you are sure all parts are functioning correctly.

BEFORE you turn the machine over to the operator for production, verify all equipment enclosure panels, guards and safety devices are in place and functioning properly.

Reporting a Safety Defect

If you believe that your equipment has a defect that could cause injury, you should immediately discontinue its use and inform the manufacturer.

The principle factors that can result in injury are failure to follow proper operating procedures (i.e. lockout/tagout), or failure to maintain a clean and safe working environment.

Chapter 2: Functional Description

2-1 Models Covered in This Manual

This manual provides operation, installation, and maintenance instructions for 1 and 2 component additive feeders. Model numbers are listed on the serial tag. Make sure you know the model and serial number of your equipment before contacting the manufacturer for parts or service.

Our additive feeders are designed to precisely feed up to two components before being used in the injection molding, blow molding or extrusion processes. Additive Feeders are configured to meet the specific requirements stated by the Customer at the time of purchase.

2-2 General Description

Our additive feeder is a highly accurate unit designed to feed one or two additives into a stream of virgin plastic pellets prior to injection molding, blow molding, or extrusion. Such additives may include color, regrind, or other free-flowing pelletized or granular materials. The additive feeder may also be appropriate for other applications. Consult the manufacturer for additional information.

2-3 Standard Features

Mechanical Features

Transport Tube

- Stainless steel augers available in ½", ¾", 1", 1-1/4" and 1-1/2" sizes
- Augers/insert assemblies are interchangeable without tools
- UHMW polyethylene auger insert is durable and easily cleaned
- Calibration hatch opens without tools
- Cleanout hatch below the flood zone opens without tools and allows the supply hopper to dump completely.
- Lightweight aluminum casting

Main Throat

- Low profile design adds only 6 inches to supply system headroom requirements
- Accomodates one or two transport assemblies
- Sturdy steel construction

Supply Hopper

- 1-cubic-foot capacity (45 pounds @ 45 lb./cubic foot)
- Design based on dynamic/static material flow characteristics
- Angled hopper geometry allows use with 60º machine supply hoppers
- Easy, fast, and complete cleanout
- Sight glasses give visual level indication
- Manual fill cover standard

Motor Assembly

- Quick release swing-away motor mount speeds auger/motor changes and cleanout
- Permanently lubricated
- Replaceable motor brushes

Electrical Features

Motor Assembly

- Continuous service fractional horsepower DC motor.
- Hall Effect sensor transmits RPM to microprocessor control
- 115/1/60 supply voltage

Controller Features

- Closed-loop control constantly monitors feedback from the auger motor RPM sensor for high accuracy and repeatability. Feed rates remain stable during main power supply voltage fluctuations.
- Remote control mounting capability permits mounting the control panel up to 9 feet from the feeder.
- Field-programmable display permits viewing in rpm, pounds per hour, kilos per hour, etc., as well as high/low limits.
- Automatic and manual/calibration operation modes.

2-4 Options

Options marked with "*" indicate options that can be factory installed or retrofitted in the field.

Special Voltage

- 230/1/50 VAC

Timer/Counter Control

- Designed for use with cycled processes like injection molding
- Cycle timer can be set to limit additive feeder cycle to avoid feeding straight color if a resin supply problem occurs in conjunction with a processing machine control relay failure.
- Batch counter provides inventory management information
- Calibration feature allows precise, repeatable sampling during setup

Timer/Elapsed Timer Control

- Designed for use with continuous processes like extrusion
- Elapsed timer provides inventory management information
- Calibration feature allows precise, repeatable sampling during setup

Dual Setpoint Control

- Used with multiple feeder installations where one feeder is feeding colored regrind and another is feeding straight color. A low level monitor senses when the supply of colored regrind is depleted and alters the feed rate of the pure color feeder to maintain precise color quality control automatically.

Extruder Following Feature

- Pulse adder board increases range of microprocessor control to 500,000 pulses per minute to accommodate a wide variety of TTL-type extruder rpm sensor signals.
- Feature is enabled with a DIP switch adjustment.

Expanded Supply Hopper

- 2.0 cubic foot capacity

Supply Hopper Covers

- Hopper mounting cutout for vacuum receivers
- Hopper loader mounting cutout for hopper loaders

Additional Auger Assemblies

- Switch augers for changing process throughputs

Mounting Adapters

- Special main throat and flanges can eliminate transitions and accommodate different machine hoppers

2-5 Accessories

Low Level Alarm

- Audible/visual alert to allow supply hopper level to avoid feeding straight resin into the processing machine
- Remote mount
- Advisory or process interrput capability
- Alarm silence/acknowledge button

Drawer Magnet

- Removes tramp metal from the process stream

2-6 Safety Devices and Interlocks

This section includes information on safety devices and procedures that are inherent to the additive feeder. This manual is not intended to supersede or alter safety standards established by the user of this equipment. Instead, the material contained in this section is recommended to supplement these procedures in order to provide a safer working environment.

At the completion of this section, the operator and maintenance personnel will be able to do the following:

- Identify and locate specific safety devices.
- Understand the proper use of the safety devices provided.
- Describe the function of the safety device.

Safety Circuit Standards

Safety circuits used in industrial systems protect the operator and maintenance personnel from dangerous energy. They also provide a means of locking out or isolating the energy for servicing equipment.

Various agencies have contributed to the establishment of safety standards that apply to the design and manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) and the Joint Industrial council (JIC) are just a few of the organizations that have joined with the plastics industry to develop safety standards.

Every effort has been made to incorporate these standards into the design of the additive feeder; however, it is the responsibility of the personnel operating and maintaining the equipment to familiarize themselves with the safety procedures and the proper use of any safety devices.

Fail Safe Operation

If a safety device or circuit should fail, the design must be such that the failure causes a "Safe" condition. As an example, a safety switch must be a normally open switch. The switch must be held closed with the device it is to protect. If the switch fails, it will go to the open condition, tripping out the safety circuit.

At no time should the safety device fail and allow the operation to continue. For example, if a safety switch is guarding a motor, and the safety switch fails, the motor should not be able to run.

Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are used on these additive feeders are primarily concerned with electrical power disconnection and the disabling of moving parts that may need to be accessed during the normal operation of the machine.

Some of the safety devices utilize a manual activator. This is the method of initiating the safety lock out. This may be in the form of a plug, lever or a handle. Within this lockable handle, there may be a location for a padlock. Personnel servicing the equipment should place a padlock in the lockout handle.

In addition to the safety devices listed above, these additive feeders are equipped with a line cord plug. This allows the operator or maintenance personnel to unplug the additive feeder from its power source and tag it out. The plug can then be tagged with any number of approved electrical lockout tags available at most electrical supply stores.

WARNING! ***Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning the additive feeder. Failure to do so may result in serious injury. No one but the person who installed the lockout may remove it.***

Chapter 3: Installation

3-1 Uncrating the Equipment

Additive feeders are shipped mounted on a skid, enclosed in a plastic wrapper, and contained in a cardboard box.

1. Pry the crating away from the skid.

   Note: ***Remove the nails holding the box to the skid and lift the box off carefully; avoiding staples in the 1' x 4' wood supports. Cut the steel banding.***

2. Use a pry bar to remove the blocks securing the unit to the skid.
3. Lift unit from sides. Use a pry bar if necessary to carefully remove the skid from the unit.
4. Lower slowly.

3-2 Rigging and Placing the Additive Feeder

Note: ***Disassemble the material transport assembly from the main throat to ease marking, drilling and installation of the additive feeder. If the machine throat is smaller than the additive feeder throat, adapters are available.***

1. Unbolt the machine hopper from your processing machine.
2. Drill holes in both flanges of the additive feeder main throat to exactly match the bolt hole pattern on your processing machine throat. Select a position for easy operator access.
3. Clamp the main throat to the machine with locking pliers.
4. Bolt the main throat to the machine, and the machine hopper to the main throat with the appropriate bolts, nuts and lockwashers.
5. Mount the control in a position with convenient operator access near the additive feeder. Avoid locations with excessive dust, vibration and moisture.

Supply System Installation

If the additive feeder is to be used with an automatic loading system, install the hopper loader, vacuum hopper, etc., in the supply hopper cover. Follow the instructions provided with the loading system.

3-3 Electrical Connections

When making electrical connections to your additive feeder, ensure that you take into consideration and make arrangements for the following:

- A qualified electrician should make all electrical connections.
- Fulfill all national, state, and local safety and electrical code requirements.
- The serial tag lists voltage, phase, and amp draw information:
    - Line voltage must be within plus or minus ten percent (±10%) of the voltage listed on the serial tag, or damage may occur.
- Install a fused disconnect with a lockout feature in the power main leading to the additive feeder if the unit will be wired directly to a power main.
- Make sure all electrical connections are tight.

Main Power Connection

The control is shipped pre-wired and attached to the additive feeder. Standard controls are supplied with a power cord with the plug wired to the control unit, ready to plug into an appropriately grounded three-prong receptacle.

Control Relay Connection

To interlock the additive feeder operation to an injection molding machine, extruder, etc., remove jumper (J1) from the terminal block in the control enclosure and wire in the control relay signal from the processing machine. The additive feeder will automatically operate while the screw is turning.

Please refer to the schematics enclosed in the information packet for the latest electrical drawings.

3-4 Setup Procedures

This section provides the procedures necessary for configuring your additive feeder.

Configuration of your additive feeder includes determining the desired feed rate and calibrating the additive feeder. We recommend that you carry out these procedures in the order given here.

> **Note:** ***Before carrying out these procedures, install all equipment as described in this section.***

Determining the Desired Feed Rate

The additive feed rate is the desired amount of additive to be introduced into the process stream per hour. To determine the feed rate, follow the procedure in this section. If the desired feed rate is known, go to the calibration procedure in the next section. The charts in figures 1 and 2 provide conversion and rate charts to assist you in your calculations.

For Cyclical Processing (Injection Molding, etc.)

To set up an additive feeder for cyclical processing, you need to know shot size, recovery time, and the letdown ratio.

Cyclical Processing Equation:

$$\frac{\text{Shot Size (oz)}}{\text{Recovery time (sec)}} \times \text{Letdown (ratio or \%)} \times 225 = \text{Feed Rate (lbs./hr.)}$$

Example:

Shot size = 8 ounces
Recovery time = 5 seconds
Letdown ratio = 20:1
8 oz./5 sec. X 1/20 = 0.08 = Desired feed rate

To convert to lbs./hr.: 0.08 oz/sec x 225 = 18 lbs./hr.

For Continuous Processing (Extrusion, etc.)

To set up an additive feeder for continuous processing, you need to know the total process throughput and the desired additive percentage or letdown ratio.

Continuous Processing Equation:

Total throughput (lbs./hr.) x percentage of additive = Feed rate

Example:

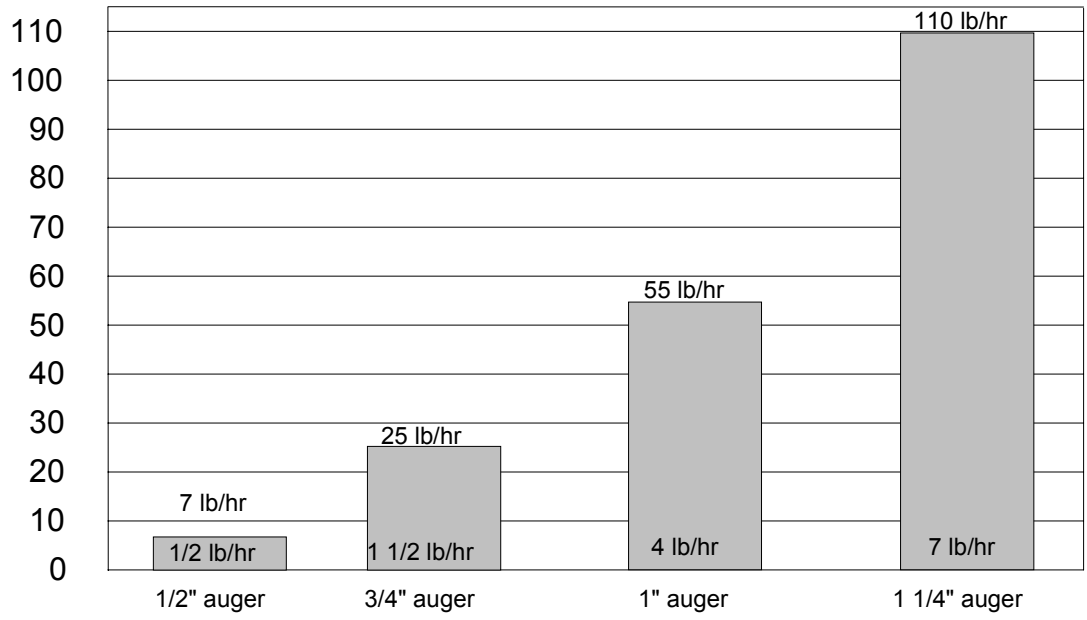
Total throughput = 100 pounds per hour
Percentage of additive = 2%

100 lbs./hr. x 0.02 = 2 lbs./hr. feed rate

Figure 1: Conversion Chart

Multiply	By	To obtain
Ounces per Second	225	Pounds per Hour
Grams	0.035	Ounces
Ounces	0.0625	Pounds
Seconds	0.00028	Hours

Figure 2: Rate Chart



Calibration Procedure

This procedure allows the operator to precisely adjust additive feed rates.

Caution! ***Never put hands or tools in or near the auger assembly when power is connected.***
Do not wear gloves or loose clothing during calibration. The auger is exposed when the calibration or cleanout hatches are open.

Equipment Needed:

- Scale
- Sample container
- Timer- stopwatch, watch/clock w/second hand

Procedure

1. Close cleanout and calibration hatches.
2. Fill the additive supply hopper.
3. Weigh the empty sample container.
4. Swing open the calibration hatch near the main throat.
5. Set the controller to a desired RPM.
6. Place the sample container below the calibration hatch.
7. Hold the three-position motor switch in the Manual position for about a minute. This lets the new setpoint stabilize and fills the auger flights with material. Discard the first sample.

   Note: ***When the additive feeder is first powered up, the motor control needs to "warm up" for a few seconds by running the motor until it stabilizes. Subsequent operation will be instantaneous.***

8. Position the empty scale container below the calibration hatch and hold the three-position motor switch in the Manual position for exactly one minute.

   Note: ***If your additive feeder is equipped with the timer option, set the timer to one minute and put the three-position switch in the Manual position. Operation will automatically stop after one minute.***

9. Weigh the sample container. Subtract the weight of the container and multiply by 60 to determine the pounds per hour feed rate.
10. Adjust the auger rpm and repeat the calibration process until the desired feed rate is achieved.

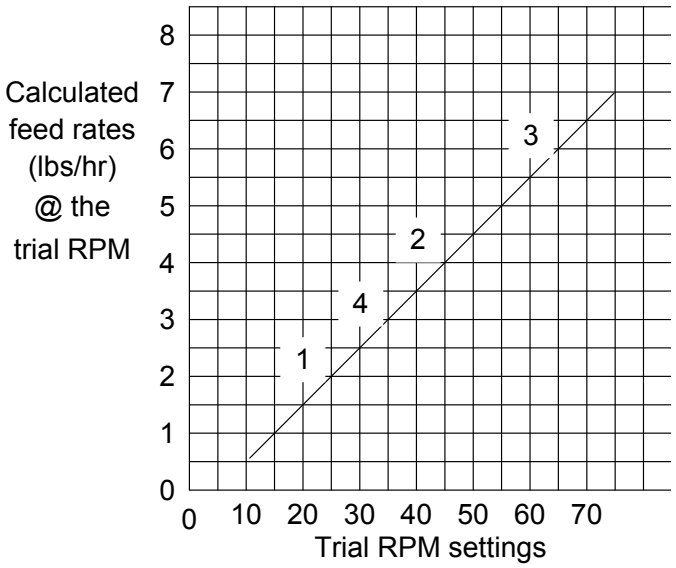
    Note: ***To speed the calibration procedure, reduce trial and error auger rpm settings and zero in on the desired feed rate. Chart the calculated feed rates from a few rpm settings on graph paper. Draw a straight line between the coordinates to establish a customized feed rate curve for the actual operating conditions. A sample graph is provided on the next page; graph paper is included in the back of this manual for use with your feeding processes.***

Examples:

This example shows how to extrapolate a desired feed rate of 3 lbs./hr., based on the feed rates of 3 trial rpm settings.

Observed Feed Rates
Sample 1 = 2 pounds per hour @ 20 rpm
Sample 2 = 4 pounds per hour @ 40 rpm
Sample 3 = 6 pounds per hour @ 60 rpm

In this example, a feed rate of 3 lbs./hr. would be about 30 rpm.



3-5 Initial Start-up

Pre-Startup Checks

- ☑ Are all the electrical connections correct, secure and to code?
- ☑ Is the auger insert locked in place?
- ☑ Are the motor and auger properly coupled and the motor mount locked in place?
- ☑ Are the cleanout and calibration hatches shut and secured?
- ☑ Are all tools, hardware, etc., cleared from the feeder?
- ☑ Is the processing machine ready for operation?
- ☑ Is the control relay connection to the processing machine properly installed?
- ☑ Is there an adequate supply of additive in the supply hopper?
- ☑ Is the supply system (if installed) ready for operation?

Starting Up the Additive Feeder

1. Turn the power switch **ON**.
2. Set the desired feed rate on the RPM display using the up or down arrows.
3. Flip the motor switch to **AUTO**.

If the additive feeder is installed correcly, it should begin operation at the desired RPM when the processing machine screw is in operation.

Shutting Down the Additive Feeder

4. Flip the motor switch to the **OFF** (center) position.
5. Turn the power **OFF**.

For long term shutdown, disconnect power and clean the additive feeder.

Chapter 4: Operation

4-1 Start-up

1. Turn the power switch **ON**.
2. Set the desired feed rate on the RPM display using the up or down arrows.
3. Flip the motor switch to **AUTO**.

If the additive feeder is installed correcly, it should begin operation at the desired RPM when the processing machine screw is in operation.

4-2 Controller Description and Operation

Identifying Control Panel Indicator Lights and Switches on the Controller

Switches

Power Switch. This switch turns the control **ON** and **OFF**.

Motor Switch. This switch has three (3) positions:

- **OFF** stops the auger motor.
- **AUTO** starts normal automatic operation.
- **MANUAL** operates the auger at the set point as long as the switch is held in this position. Use this feature when calibrating the feeder or during cleanout.

Indicator Lights

Motor Light. This indicator lights when the auger motor is turning.

Auger Speed. This LED displays the auger speed setpoint.

Timer/Counter Control Operation (Injection Molding Applications)

The Timer/Counter control is designed for use with cyclical processes like injection molding and features a timer and counter module. It also acts as a cycle override safety timer.

Timer Module

This feature of the controller assists in calibration of the additive feeder (See Page 20 for specific calibration instructions.).

Procedure

1. Set the timer to the desired calibration period, using the round timer keys (See the timer information sheet for additional information.).
2. Start the additive feeder by flipping the **MOTOR** switch to the **MANUAL** position.
3. When the timer times out, the feeder automatically stops.

Used as a Cycle Override Safety Timer

This component of the controller allows the operator to override the molding machine shot cycle when the additive feeder motor is running in **AUTO** mode.

Procedure

1. Time the duration of feeder operation during a typical Injection molding machine shot cycle.
2. Set the timer to a slightly longer value.
3. Start the additive feeder by flipping the motor switch to the **AUTO** position.
4. If the timer times out because of a process flow problem, the feeder will automatically stop.
5. Reset the power switch.

Counter Module

The counter module may be used as an inventory management aid and can also confirm the total cycles between reset independent of the IMM's control. Every IMM cycle will increment the display value. The counter module has battery-backed memory and will not lose count if the electrical power is interrupted.

- Press the **RESET** button to reset the counter.

> ***Note:*** ***Remove the jumper on the back of the module to lock out the reset button. Replace the jumper to restore reset button operation. Disconnect the power before moving the jumper.***

Timer/Elapsed Timer Control (Extrusion & Blow Molding Applications)

The Timer/Elapsed Timer control is designed for use with continuous processes like extrusion and blow molding and features a timer and elapsed time module.

Timer Module

This feature of the controller assists in calibration of the additive feeder (See Page 20 for specific calibration instructions.).

1. Set the timer to the desired calibration period, using the round timer keys (see the timer information sheet for additional information.)
2. Start the additive feeder by flipping the motor switch to the **MANUAL** position.
3. When the timer times out, the feeder will automatically stop.

Elapsed Time Module

The elapsed time module may be used as an inventory management aid for continuous processing operations.

The timer module measures the time the additive feeder control receives the monitored control relay signal from the extruder/blow molder machine. The timer module has a battery-backed memory and will not lose the elapsed time of operation if the electrical power is interrupted.

- Press the **RESET** button to reset the counter.

> ***Note:*** ***Remove the jumper on the back of the module to lock out the reset button. Replace the jumper to restore reset button operation. Disconnect power before moving the jumper.***

Dual Setpoint Control Operation (2 Component Applications)

A dual setpoint control operation is offered on the dual auger/hopper additive feeder. Typically, one feeder hopper is filled with additive and the other (with a proximity switch) is filled with regrind.

This option allows for the accurate addition of additive and provides a consistant addition of regrind into the process stream.

Regrind Feeder with Proximity Switch

The regrind feeder feeds regrind into the process stream. Calibrate it to deliver the desired letdown ratio when operating with the other Set Point #1 feeder motor control. If the supply of regrind drops below the proximity switch, the regrind feeder stops and the other feeder switches to the Set Point #2 motor control. When the regrind level in the regrind feeder supply hopper rises above the proximity switch, the regrind feeder starts automatically and control of the other feeder is restored to Set Point #1.

Dual Rate Feeder with Two Motor Controls

Set Point #1 Motor Control – Top (High Level)

The Set Point #1 motor control should be calibrated and set to the feed rate needed to achieve the desired additive letdown rate when feeding both regrind and additive (See calibration section). This is typically lower than the Set Point #2 control setpoint.

Set Point #2 Motor Control – Bottom (Low Level)

The Set Point #2 motor control should be calibrated and set to the feed rate needed to achieve the desired additive letdown rate without the addition of any regrind into the process stream (See calibration section). This setpoint is typically higher than the Setpoint #1 control's setpoint.

If the Regrind feeder's supply level is below the proximity switch, a relay stops its operation and puts the Setpoint #1 control in command instead until the regrind in the Regrind feeder's hopper rises back above the proximity switch.

> **Note:** ***Connect the proximity switch to the field contact terminals of the regrind control to turn the feeder system off on low level.***

Extruder Tracking Control

The extruder tracking control option allows the additive feeder's auger (follower) to turn in a precise ratio to the speed of your extruder screw (master). The speed control on the feeder can be set for any feed ratio from 1% to 999.9%.

The extruder tracking control detects the speed of the extruder screw and causes the feeder screw to rotate at the desired RPM. In effect, the extruder tracking control acts as an automatic speed control.

The extruder tracking control requires a **5 VDC TTL NPN RPM** signal from the extruder. Use an existing RPM signal from the extruder; consult with the extruder's manufacturer for the signal type and frequency.

You will need to know:

1. The signal voltage
2. The number of pulses per extruder screw revolution

A wide variety of sensors can be supplied by the manufacturer to suit your needs if the extruder control circuit does not provide a suitable signal.

These sensors include:

- Inductive proximity sensors to sense gear teeth.
- Magnetic pickups to sense affixed magnets.
- Optic sensors to sense affixed reflective tape.

Consult your sales representative for additional information.

Extruder Tracking Installation and Setup

The additive feeder control is supplied with standard factory defaults. Control programming is required to suit the requirements of your process.

Connect the TTL signal acquired from the extruder control or from a sensor you have installed to the terminal strip as shown in the electrical schematics provided with your unit's installation packet.

1. Install the feeder as described in Chapter 3.
2. Calibrate the feeder as described on Page 20. Determine the feed rates at different rpms. We recommend that you plot the feed rates on graph paper.
3. Calculate a new display constant taking the extruder screw signal into account.

$$\text{Constant} = 1000 \times \frac{\text{\# of Pulses per Revolution of Extruder Screw ①}}{\text{\# of Pulses per Revolution of the Feeder Screw ②}}$$

① If not counted directly from screw, multiply by a "fudge factor" to get the pulses per extruder screw rpm.

② Factory set at 50.4 (PPR x 25.2 gear ratio).

4. Program the control to the new constant, as described in the next section "Field Control Programming."
5. Change DIP switch #5 to **ON**.

6. Determine the desired additive feeder setpoint (% of extruder (master) screw RPM). To determine this, you must know:
    - Total extruder feedrate (lbs./hr.).
    - The RPM of the extruder screw at that feedrate.
    - The letdown ratio of the additive (% or :).
    - The additive feedrate required at that letdown ratio (total feedrate X letdown ratio).
    - The additive feedrate RPM needed to achieve this feedrate (as determined by the calibration procedure).

Extruder Tracking Equation:

Set Point = (rpm of feeder / rpm of extruder) x 100

Example:

Total extruder feedrate = 500 pounds per hour
Extruder screw rpm for 500 lbs/hr = 50 rpm
Additive letdown percentage = 7%
Additive feedrate = 500 X 0.07 = 35 lbs./hr.
Feeder auger rpm needed for 35 lbs./hr. = 44 rpm (as the calibration procedure has shown)
Assuming this, set point = 44 rpm/50 rpm x 100 = 88 or 88% of the extruder screw speed.

Field Control Programming

The standard additive feeder controller has the ability to display feed rates in units other than the factory set auger RPM display. With the proper programming, the feeder can display pounds/hour, grams/minute, etc. The non-volatile memory retains the program if the power is interrupted.

Note: ***The field programmer should have a basic understanding of programmable motor controls before attempting to reprogram the display. Page 32 lists the factory default settings.***

WARNING! ***This procedure involves resetting a DIP switch within a live electrical enclosure. Only persons with the proper knowledge of and respect for working on energized electrical devices should attempt this procedure. Use extreme caution!***

To program a custom feed rate display, first calculate the new constant.

Equation:

$$\text{CONSTANT} = 1500 \times \frac{\text{DESIRED DISPLAY SETTING}}{\text{MOTOR RPM X PULSES PER REVOLUTION}}$$

Desired Display Setting

This is what you want to see on the display during operation. For example, if you are programming to display pounds/hour and you want to feed ten pounds/hour, this number would be 10.

Motor RPM = 25.2 X Auger RPM

If calibration determines that a 40 rpm auger speed delivers 10 pounds per hour, multiply 40 by the gearbox ratio [25.2:1] to calculate motor rpm, for example, 1,008.

Pulses Per Revolution = 2

The motor shaft magnet/sensor pulses twice per motor revolution.

Example 1:

Calculating a constant to display pounds per hour: If calibration (Page 20) determines that, for example, a 40 rpm auger speed feeds 10 pounds per hour, the following calculation will permit programming the display to read in pounds per hour. The constant calculated has been rounded to the desired decimal place.

Equation:

$$\text{Constant} = (1500 \times 10) / (25.2 \times 40 \times 2) = 7.44$$

Example 2:

How the factory pre-set constant was calculated:

Equation:

$$\text{Constant} = (1500) / (25.2 \times 2) = 30.0$$

Programming Mode

The motor will stop when in Programming mode.

1. Make sure DIP switches 1 through 4 and 7 and 8 are **OFF**.
2. Flip switch 7 to **ON.**
3. The display should read **PROG.**
4. Follow the instructions given below to view and/or edit any of the variables.

Viewing or Changing Displayed Decimal Place/Rate or Time Mode Select

1. Make sure you are in Programming Mode, then flip DIP switch 4, **RATE-TME MODE/PROGRAM DECIMAL PLACE, ON.**
2. The current decimal point setting, if any, **FACTORY SETTING = 0,** will be displayed.
3. Use the Up or Down buttons to change the decimal point as desired. Use **0** for **NO** decimal point.
4. When finished, flip DIP switch 4 to **OFF.**
5. The display should read **PROG** (the decimal point, if any, is also displayed).

Viewing or Changing the Constant

1. Calculate the constant for your application using the formula listed on the previous page.
2. Make sure you are in Programming Mode, then flip DIP switch 1, **PROGRAM CONSTANT,** to **ON**.
3. The current value for the constant, **FACTORY SETTING = 30**, should not be visible on the LED display.
4. Use the Up or Down buttons to adjust the constant value.
5. When finished, flip DIP switch 1 to **OFF.**
6. The display should read **PROG.**

The display setting is set to the slowest speed when you exit the Programming Mode.

Programming for Follower Operation

1. Enter Programming Mode, then turn DIP switches 5, **MASTER/FOLLOWER SELECT,** and 1, **PROGRAM CONSTANT,** to **ON.**
2. Set constant to:

$$\text{CONSTANT} = 1000 \times \frac{\text{PULSES PER REVOLUTION OF MASTER}}{\text{PULSES PER REVOLUTION OF FOLLOWER} = 30.0}$$

3. Turn **OFF** switches 1 and 7.
4. Turn **OFF** AC power, then reapply AC power. The control is now set for follower operation.

Viewing or Changing the Program Minimum Setting

1. Enter the programming mode, then flip DIP switch 2, **Program Minimum Setting,** to **ON.**
2. The current value for the lower limit **FACTORY SETTING = 0** will appear in the LED display.
3. Use the Up or Down buttons to change the lower limit, as desired.
4. When finished, flip DIP switch 2 to **OFF.**
5. The display should read **PROG.**

Viewing or Changing the Program Maximum Setting

1. Enter the programming mode, then flip DIP switch 3, **PROGRAM MAXIMUM SETTING** to **ON.**
2. The current value for the upper limit **FACTORY SETTING = 70** will appear in the LED display.
3. Use the Up or Down buttons to change the upper limit, as desired.
4. When finished, flip DIP switch 3 to **OFF.**
5. The display should read **PROG.**

Exiting Programming Mode and Returning to Run Mode

1. Make sure DIP switches 4, **TIME/RATE MODE SELECT**, and 5, **MASTER/FOLLOWER MODE SELECT** are in the desired positions **factory Setting 4 = 1, 5 = OFF, ON FOR OPTIONAL EXTRUDER TRACKER CONTROLS** ***BEFORE*** entering the **RUN** mode (DIP switch 7 **OFF**).
2. Make sure DIP switches 1 through 4 are **OFF**.
3. If satisfied with the programmed values, flip DIP switch 7 to **OFF.**
4. Control should begin to operate normally, using the values and modes selected.

Figure 3: DIP Switch Function Table

Switch 1	Program Constant	
Switch 2	Program Minimum Setting	
Switch 3	Program Maximum Setting	
Switch 4	Decimal Select	**0 – 4** = Decimal Points
Switch 5	Master/Follower Select	**OFF** = Master **ON** = Follower
Switch 6	Do Not Use – Set to **OFF**	
Switch 7	Program/Run Select	**OFF** = Run **ON** = Program
Switch 8	Do Not Use – Set to **OFF**	

Additive Feeder Control Factory Defaults

WARNING! ***This procedure involves resetting a DIP switch within a live electrical enclosure. Only persons with the proper knowledge of and respect for working on energized electrical devices should attempt this procedure. Use extreme caution!***

Note: ***Set the decimal point with DIP switch 4 first to avoid confusion when keying in the presets; for example, 300 and 30.0.***

Figure 4: Additive Feeder Control Factory Defaults

DIP	Variable	Pre-set
Switch 1	Auger RPM Constant	30.0
Switch 2	Program Minimum	0.0
Switch 3	Program Maximum	70.0
Switch 4	Decimal Place	0.3
Switch 5	Master/Follower Select	
	Standard Control	OFF
	Optional Extruder Tracking Control	ON

4-3 Shutting Down the Additive Feeder

1. Flip the motor switch to the **OFF** (center) position.
2. Turn the power **OFF**.

For long term shutdown, disconnect power and clean the additive feeder.

Chapter 5: Maintenance

5-1 Preventative Maintenance Schedule

The checklist below contains a list of items which should be inspected and/or replaced to keep your Additive Feeder operating at peak efficiency. Perform each inspection at the regular intervals listed below.

System model #	Serial #

Every week	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By
Inspect auger, sleeve and hopper throat. Clean if dirty.													

Every month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lock out electrical power and inspect electrical wiring for integrity.												
Visually inspect the operation of motor and auger while it is operatng.												

- Photocopy this page for your maintenance records -

5-2 Preventative Maintenance

This section describes maintenance procedures which will increase the longevity and efficiency of your additive feeder. Perform them at the regular intervals listed on the checklist on the previous page.

Material Cleanout/Changeover

Caution! ***Never put hands or tools in or near the auger assembly when power is connected!***

Do not wear gloves or loose clothing when working near the auger assembly!

1. Remove all remaining additive from the supply hopper by opening the cleanout hatch. The motor assembly must be disengaged to fully open the cleanout hatch.
2. Re-engage the motor assembly and run any remaining additive out of the feeder by opening the calibration hatch and holding the three-position motor switch in the **MANUAL** position.
3. Disengage the motor assembly and remove the auger. Release the insert by pulling the auger insert release knob on the side of the material transfer tube assembly. Slide the insert out through the motor end of the transport tube. Clean both the auger and the insert.
4. Clean the interior of the supply hopper and any additive remaining in the calibration or cleanout hatches.

5-3 Corrective Maintenance

This section provides you with the information necessary to correct or repair any issues which might appear during the normal operation of your additive feeder. Although we have listed how to perform these procedures, it is recommended that you call the Service Department to have any in-depth maintenance performed.

Auger Assembly Changeover

Our additive feeder auger assemblies may be removed and installed without tools. All auger sizes are interchangeable.

Caution! ***Disconnect and/or lock out electrical power* before *removing an auger assembly or performing any service or maintenance.***

Removing Auger Assembly

1. Empty the supply hopper by swinging open the cleanout hatch.
2. Disengage the motor assembly from the auger by removing the motor mount linchpin and swinging out the motor.
3. Pull the auger out.
4. Swing open the calibration hatch.
5. Release the UHMW auger insert by pulling out the spring loaded pluger and turning it a quarter turn.
6. Slide the auger insert out through the transport tube assembly.
7. Clean any remaining additive from inside the feeder.

Installing Auger Assembly

Make sure the insert and auger to be installed are a matching set.

1. Slide the UHMW insert into the material transport tube. Line up the insert's groove with the locking pin in the side of the transport tube. Be sure the locking pin is retracted.
2. When the locking pin is aligned with the insert's groove, release the locking pin. The locking pin will ride in the groove as the insert is pushed into the transport tube.
3. When the insert is in place, the locking pin will snap into a retaining slot in the insert's guide groove.
4. Insert the matching auger into the insert and line up the motor coupler with the pin on the end of the auger.
5. Fasten the motor assembly into place by restoring the linchpin to its original position.
6. Close and secure the calibration and cleanout hatches.

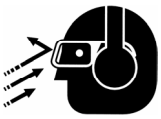
Motor Brush Replacement

The two (2) motor brushes should be replaced when they are worn down to less than 1 inch in length. Replacement brushes are "pre-worn" by the manufacturer and require no break-in period.

Caution! ***Disconnect power to the Additive Feeder before changing the motor brushes.***

1. Remove a brush cap screw near the back of the motor.

Caution! ***The motor brushes are spring loaded. Use care to avoid eye injury when removing the cap screw. Wear safety glasses when performing this procedure.***



2. Remove the brush. Make note of the direction of the tapered end of the brush face.
3. Insert the new brush (See Figure 5 below for Brush Part Numbers) with the tapered end facing the same way as the worn brush.
4. Secure the new brush with the cap screw.
5. Repeat the above steps for the other brush.

The motor is now ready for use.

Figure 5: Replacement Motor Brush Part Numbers

Part Number	Description
A0541239	115 VAC controls, motor plate marked 90 VDC, 1/20 HP
A053426-BS	115 VAC controls, motor plate marked 90 VDC, 1/10 HP

Chapter 6: Troubleshooting

6-1 Introduction

The utmost in safety precautions should be observed at all times when working on or around the machine and the electrical components. All normal trouble-shooting must be accomplished with the power off, line fuses removed, and with the machine tagged as out of service.

The use of good quality test equipment cannot be over-emphasized when troubleshooting is indicated. Use a good ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per-volt on DC scales. Popular combination meters, VOM and VTVM can be selected to provide the necessary functions.

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, we recommend that you check the associated circuitry and assemblies for other defective devices. It is common to replace the obviously damaged component without actually locating the real cause of the trouble. Such hasty substitutions will only destroy the new component. Refer to wiring diagrams and schematics.

Locating mechanical problems, should they occur, is relatively straightforward. When necessary, refer to the parts catalog section.

Problem	Possible cause	Corrective action
Feeder will not run with switch in **AUTO** or **MANUAL** position.	No power to the control.	Plug in control.
	Power switch is off.	Turn power on.
	Fuse is blown.	Replace fuse.
	Auger is jammed.	Clear.
	Loose control wiring.	Tighten.
	Power switch has failed.	Replace.
	Motor switch has failed.	Replace.
	Feeder is wired incorrectly to the processing machine.	Refer to the control enclosure wiring diagram.
	Control relay has failed.	Replace.
	Motor control has failed.	Replace.
	Motor brushes are worn.	Replace.
	Controller is in the program mode. Display reads **PROG.**	Reset DIP Switch 7.
	Optional timer set incorrectly.	Reset timer.
	Optional timer mode set incorrectly.	Set operation mode to **H** and configuration to **d.**
	Optional timer has failed.	Replace.

Problem	Possible cause	Corrective action
Motor will not stop.	Field contact jumper (J1) has not been removed. **AUTO MODE.**	Remove jumper and wire the terminals to the processing machine relay.
	Field contact to the processing machine has failed.	Check wiring/check the relay on the processor.
	Motor switch has failed.	Replace.
	Field contact to process machine missing or loose.	Correct.
	Control relay has failed.	Replace.
	Motor control has failed.	Replace.
	Optional timer set incorrectly.	Reset.
	Optional timer has failed.	Replace.
Motor runs only at maximum speed.	Signal from motor speed sensor missing.	Secure the sensor connections.
	Motor control has failed.	Replace.
	Motor speed sensor has failed.	Replace.
	Motor speed sensor magnet misaligned.	Adjust.
Motor speed not constant.	Intermittent signal from motor speed sensor.	Secure the sensor connections.
	Motor speed sensor has failed.	Replace.
	Motor control has failed.	Replace.
	Material flow problem.	Inspect for blockage, etc.
Additive is contaminated by color from previous run.	Feeder was not cleaned adequately prior to operation.	See Section 5-2 on Page 34 for cleanout instructions.

Other service problems or questions can be answered by contacting the Service Department.

Chapter 7: Appendix

7-1 Warranty

The manufacturer warrants all equipment manufactured by it to be free from defects in workmanship and material when used under recommended conditions. The company's obligation is limited to repair or replace FOB the factory any parts that are returned prepaid within one year of equipment shipment to the original purchaser, and which, in the company's opinion, are defective. Any replacement part assumes the unused portion of this warranty.

This parts warranty does not cover any labor charges for replacement of parts, adjustment repairs, or any other work. This warranty does not apply to any equipment which, in the company's opinion, has been subjected to misuse, negligence, or operation in excess of recommended limits, including freezing or which has been repaired or altered without the company's express authorization. If the serial number has been defaced or removed from the component, the warranty on that component is void. Defective parts become the property of the warrantor and are to be returned.

The company is not liable for any incidental, consequential, or special damages or expenses. The company's obligation for parts not furnished as components of its manufactured equipment is limited to the warranty of the manufacturers of said parts.

Any sales, use, excise, or other tax incident to the replacement of parts under this warranty is the responsibility of the purchaser.

The company neither assumes nor authorizes any other persons to assume for it any liability in connection with the sale of its equipment not expressed in this warranty.

Many types of the manufacturer's equipment carry an additional one-year service policy. Consult your sales representative for specific details.

7-2 Optional Components

The following is a list of options which your Additive Feeder may have been equipped with:

Special Voltage

- 230/1/50 VAC

Timer/Counter Control

- Designed for use with cycled processes like injection molding
- Cycle timer can be set to limit additive feeder cycle to avoid feeding straight color if a resin supply problem occurs in conjunction with a processing machine control relay failure.
- Batch counter provides inventory management information
- Calibration feature allows precise, repeatable sampling during setup

Timer/Elapsed Timer Control

- Designed for use with continuous processes like extrusion
- Elapsed timer provides inventory management information
- Calibration feature allows precise, repeatable sampling during setup

Dual Setpoint Control

- Used with multiple feeder installations where one feeder is feeding colored regrind and another is feeding straight color. A low level monitor senses when the supply of colored regrind is depleted and alters the feed rate of the pure color feeder to maintain precise color quality control automatically.

Extruder Following Feature

- Pulse adder board increases range of microprocessor control to 500,000 pulses per minute to accommodate a wide variety of TTL-type extruder rpm sensor signals.
- Feature is enabled with a DIP switch adjustment.

Expanded Supply Hopper

- 2.0 cubic foot capacity

Supply Hopper Covers

- Hopper mounting cutout for vacuum receivers
- Hopper loader mounting cutout for hopper loaders

Additional Auger Assemblies

- Switch augers for changing process throughputs

Mounting Adapters

- Special main throat and flanges can eliminate transitions and accommodate different machine hoppers

7-3 Technical Specifications

Annex B Information

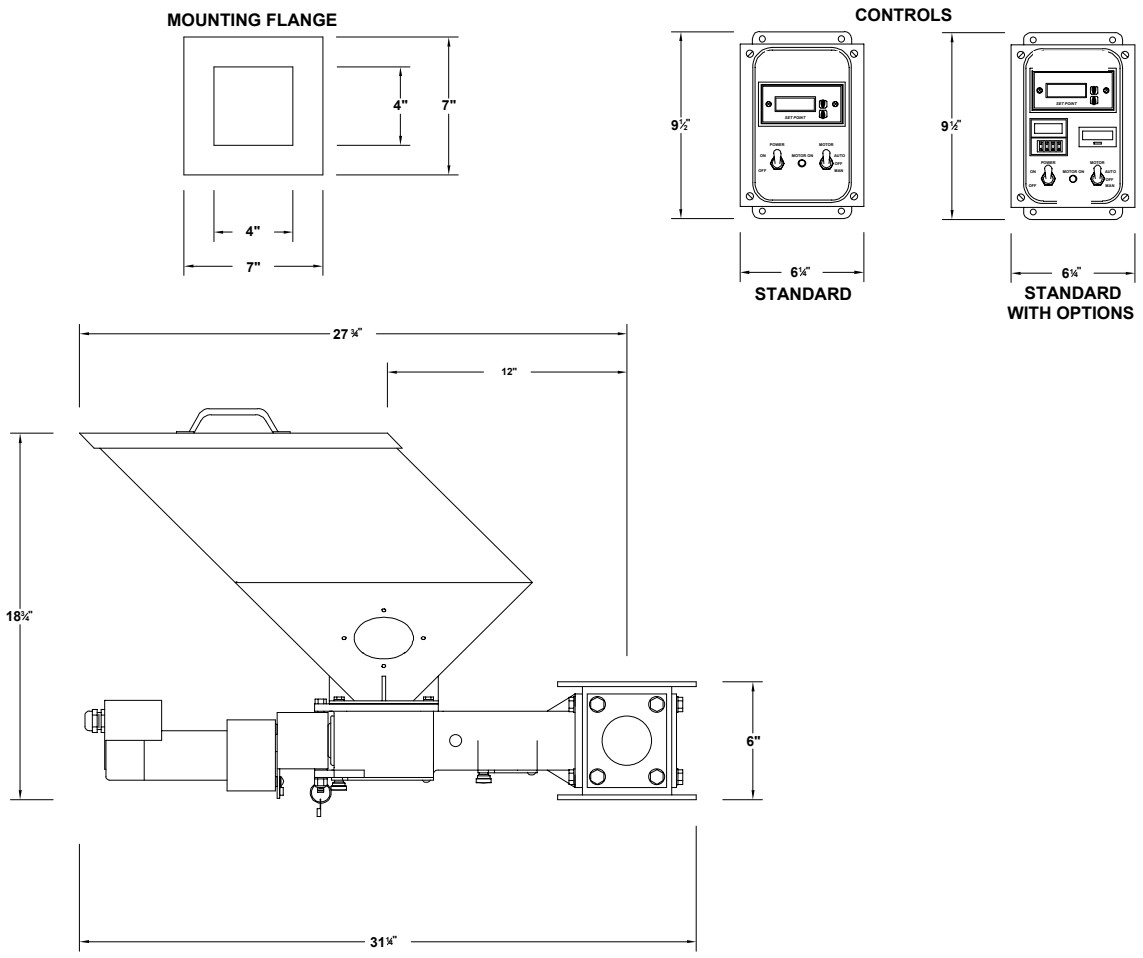
The following design information is provided for your reference:

1. No modifications are allowed to this equipment that could alter the CE compliance
2. Ambient temperature: 0 degrees Celsius – Maximum (104 degrees Fahrenheit)
3. Humidity range: 50% relative humidity
4. Altitude: Sea level
5. Environment: Clean, dust-free and non-explosive
6. Radiation: None
7. Vibration: Minimal, i.e. machine mounting
8. Allowable voltage fluctuation: +/- 10%
9. Allowable frequency fluctuation: Continuous +/- 1%
   Intermittent +/- 2%
10. Nominal supply voltage: 460/3/60 (Verify on serial number tag)
11. Earth ground type: TN (system has one point directly earthed through a protective conductor)
12. Power supply should include a ground connection.
13. Over-current protection is supplied in the additive feeder, but additional protection should be supplied by the user.
14. The door-mounted disconnect serves as the electrical disconnect device.
15. Additive feeder is not equipped with local lighting.

16. Functional identification
17. Additive Feeder is equipped with a CE mark
18. Additive Feeder is supplied with an operating manual in the language of the destination country.
19. Cable support may be required for power cord, depending on final installation.
20. No one is required to be in the interior of the electrical enclosure during the normal operation of the unit. Only skilled electricians should be inside the enclosure for maintenance.
21. Doors can be opened with a screwdriver, but no keys are required.
22. Two-hand control is not required or provided.
23. All additive feeders should be moved around and set in a place with a lift truck or equivalent.
24. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the additive feeder is operating.
25. An inspection report detailing the functional test is included with the additive feeder.
26. The machine is not equipped with cableless controls.
27. Color-coded (harmonized) power cord is sufficient for proper installation.

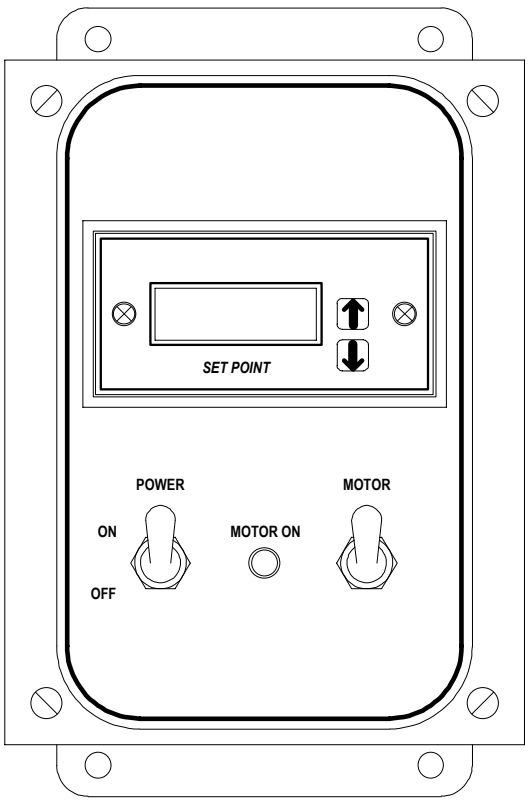
7-4 Drawings and Diagrams

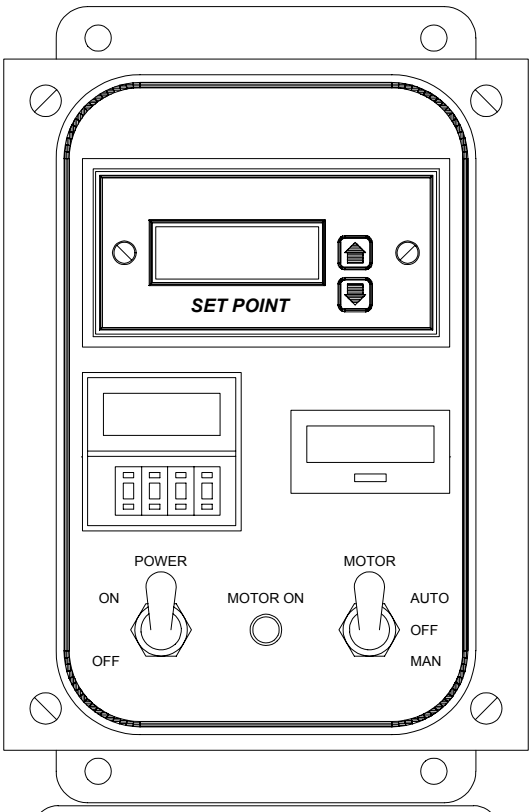
Figure 6: Additive Feeder Specifications and Overall Dimensions

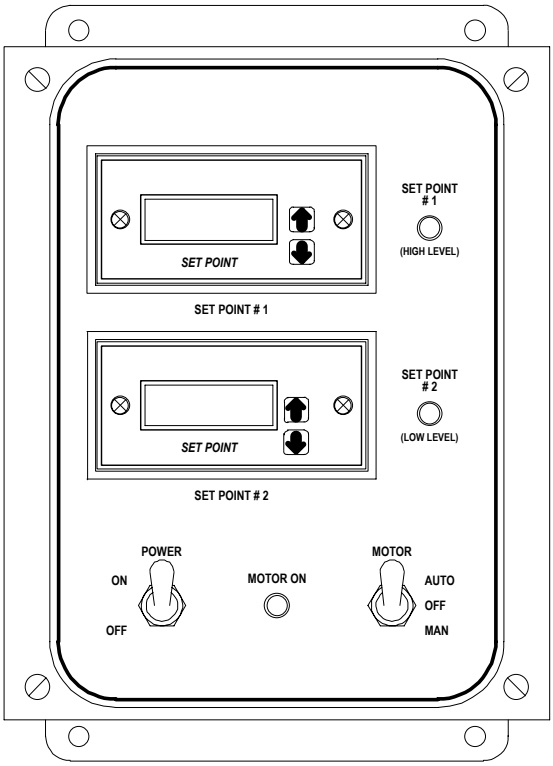


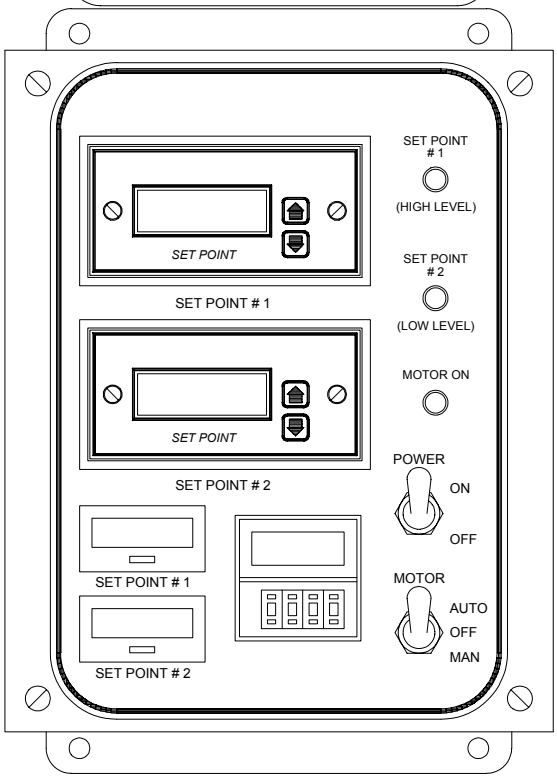
Additive Feeder Type	Hopper capacity	Electrical supply	Amp draw	Shipping weight
1 Component	1.0 Cu. Ft.	115-1-60	1.3	50 lbs.
2 Component	(2) 1.0 Cu. Ft.	115-1-60	2.5	90 lbs.

Figure 7: Typical Additive Feeder Controllers


SET POINT
POWER
ON
OFF
MOTOR ON
MOTOR


SET POINT
POWER
ON
OFF
MOTOR ON
MOTOR
AUTO
OFF
MAN


SET POINT
SET POINT # 1
(HIGH LEVEL)
SET POINT # 1
SET POINT
SET POINT # 2
(LOW LEVEL)
SET POINT # 2
POWER
ON
OFF
MOTOR ON
MOTOR
AUTO
OFF
MAN


SET POINT
SET POINT # 1
SET POINT # 1
(HIGH LEVEL)
SET POINT
SET POINT # 2
SET POINT # 2
(LOW LEVEL)
MOTOR ON
POWER
ON
OFF
SET POINT # 1
SET POINT # 2
MOTOR
AUTO
OFF
MAN

7-5 Spare Parts List

Figure 8: Exploded Assembly Drawing

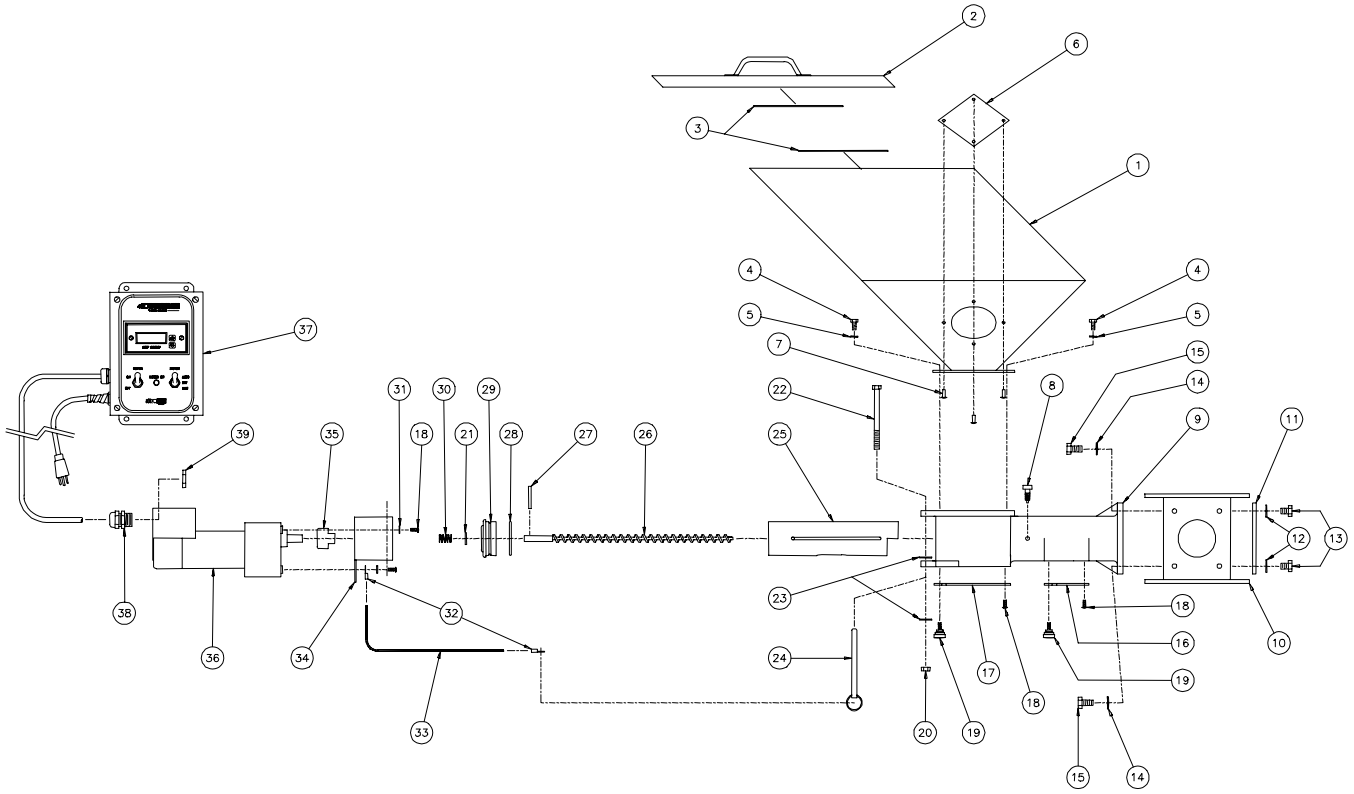


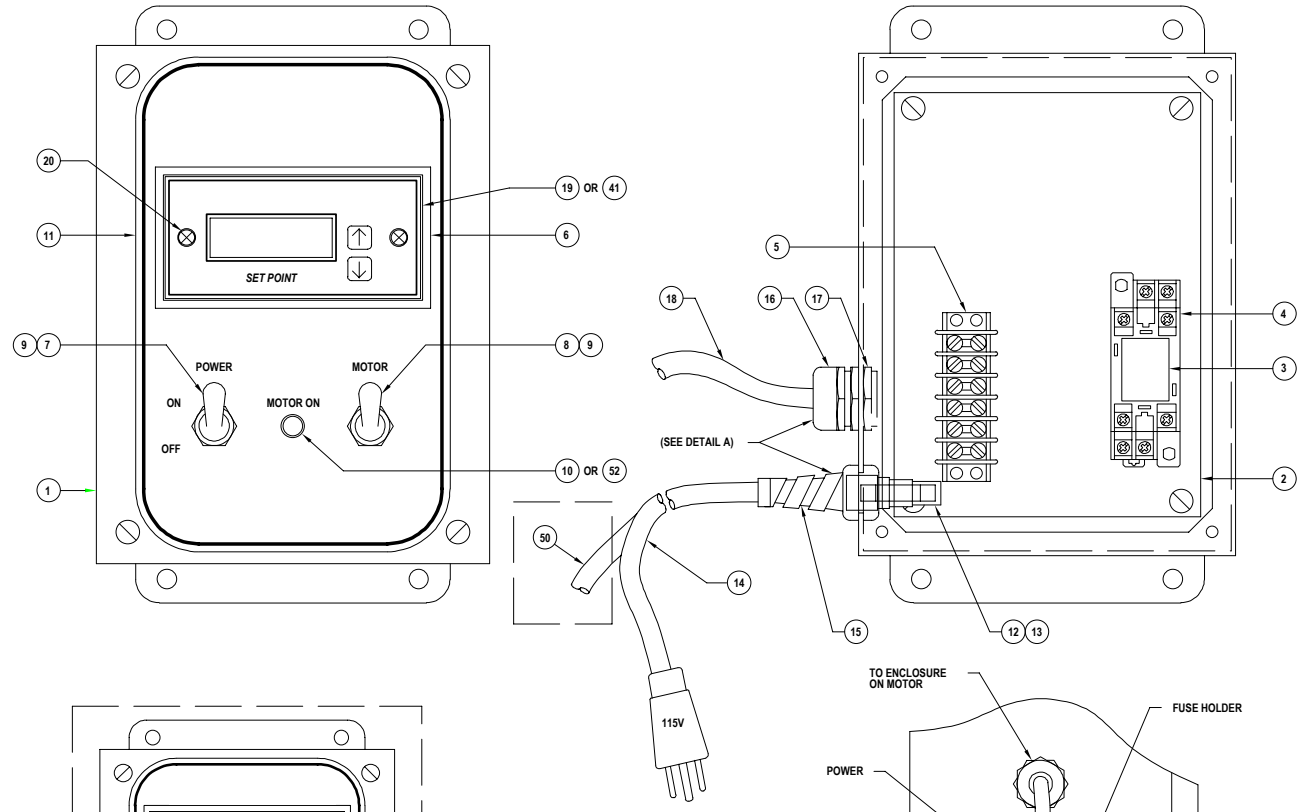
Figure 9: Parts List

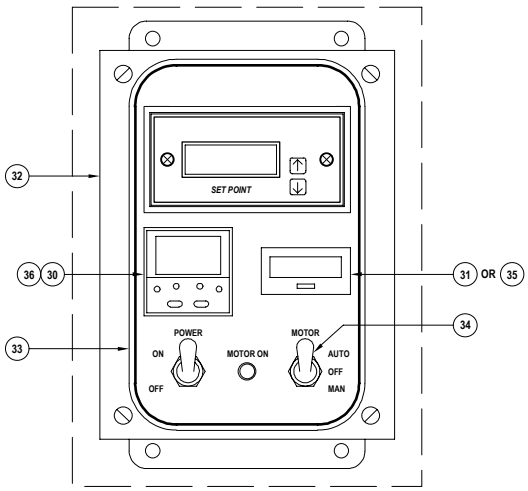
Detail #	Part number	Part/assembly description
1	A0541207	Supply Hopper, 1.0 Cubic Foot
1	A0541208	Supply Hopper, 2.0 Cubic Foot
2	A0541225	Hopper Cover, Manual Fill
2	A0541226	Hopper Cover with Cutout for .1 Cubic Foot Hopper Loader
2	A0541227	Hopper Cover with Cutout for .25 Cubic Foot Hopper Loader
3	A0541286	Magnetic Stripping for Supply Hopper Cover
4	A0541285	Screw, ¼-20 x ½", HHC, Grade 5
5	A0101190	Lock Washer, ¼"
6	A0541206	Supply Hopper Sight Glass
7	W0012471	Blind Rivet, 3/16"
8	W00052210	Plunger Pin, Retractable
9	A0541201	Material Transfer Tube
10	A0541202	Main Throat, Standard, 6"
10	A0541208	Main Throat, Optional Expanded, 8"
11	A0541205	Main Throat Sight Glass
12	A0069242	Flat Washer, 5/16
13	W00001948	Screw, 3/8-16 x ½"
14	A0069203	Lock Washer, 3/8"
15	A0069458	Screw, 3/8-16 x 3/4"
16	A0541216	Calibration Sample Port Plate
17	A0541215	Clean Out Port Plate
18	A0540904	Screw, 10-32 x ½"

Detail #	Part number	Part/assembly description
19	W00052550	Knob, Knurled
20	A0069218	Stop Nut, 5/16-18
21	A0069549	Flat Washer, 3/8"
22	A0541279	Screw, 5/16-18 x 4½"
23	A0069241	Flat Washer, ¼"
24	A0541277	Quick Release Pin
25	A0541209	Feed Tube Insert, 1/2"
25	A0541210	Feed Tube Insert, 3/4"
25	A0541211	Feed Tube Insert, 1"
25	A0541212	Feed Tube Insert, 1 1/4"
25	A0541213	Feed Tube Insert, 1 1/2"
25	A0541214	Feed Tube Insert, 1 3/4"
26	A0541219	Auger, 1/2"
26	A0541220	Auger, 3/4"
26	A0541219	Auger, 1"
26	A0541292	Auger, 1 1/4"
Assy.	A0541292	Auger Assembly, 1/2" *
Assy.	A0541293	Auger Assembly, 3/4" *
Assy.	A0541294	Auger Assembly, 1" *
Assy.	A0541295	Auger Assembly, 1 1/4" *
Assy.	A0541296	Auger Assembly, 1 1/2"
Assy.	A0541297	Auger Assembly, 1 3/4"
27	W00015504	Roll Pin
28	A0541284	O Ring
29	A0541217	Thrust Bearing
30	A0541283	Compression Spring
31	W00000947	Lock Washer, #10
32	A0103129	Terminal Ring for Retaining Cable
33	W00013647	Pin Retaining Cable
34	A0541229	Motor Mount
35	A0541282	Jaw Coupler
36	A0555661	Motor Assy, 115 VAC, 1/10 H.P.
36	A0541298	Motor Assembly, 115 VAC 1/20 H.P.
36	A0547487	Motor Assembly, 115 VAC, Low RPM 1/20 H.P.
37	A0541265	Control, 115 VAC
37	A0541266	Control, 115 VAC, Timer/Cycle Counter
37	A0541267	Control, 115 VAC, Timer/Elapsed Timer
37	A0541268	Control, 115 VAC, Extruder Tracking
37	A0541269	Control, 115 VAC, Extruder Tracking, Timer/Elapsed Timer
37	A0544795	230 VAC/115 VAC Transformer Control Assembly
38	A0541039	Strain Relief for Control Cable
39	A0541262	Lock Nut for Strain Relief
	A0539035	Transition Flange, Feed Throat, 7" to 4" Square

* Auger assemblies include details 26, 27, 28, 29, 30, & 12. Order the appropriately-sized feed tube insert (Detail 25) if needed.

Figure 10: One Component Control Enclosure Parts Identification





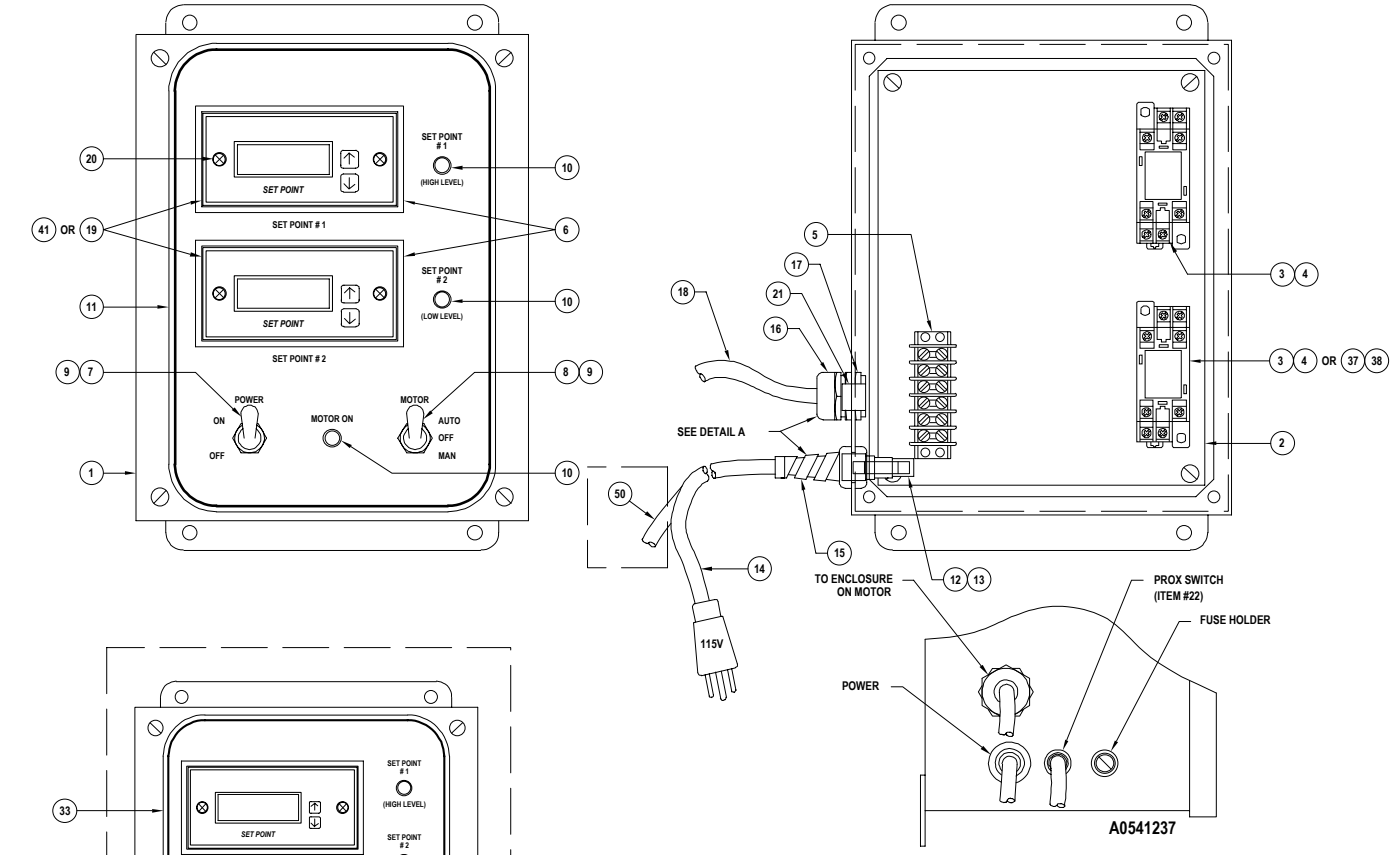
230V OPTION	50	1	A0544795	ASSY,TRANSFORMER,CNTL,230:115
EXTRUDER TRACKING OPTION (SEE NOTE #2)	41	1	A0541610	GRAPHIC, CONTROLLER, PERCENT
	40	1	A0541673	SENSOR, OPTICAL, PICKUP
TIMER/CYCLE COUNTER OR TIMER/ELAPSE TIME COUNTER OPTION (SEE DETAIL B)	36	1	A0541238	TIMER, SOCKET, 11 PIN
	35	1	A0541276	COUNTER, ELAPSE TIME, LCD
	34	1	W00014736	SW, TOGGLE, DPDT, ON-OFF-ON
	33	1	A0541234	GRAPHIC, TMR/CNT
	32	1	A0541252	ENCLOSURE, 8 x 6 x 6, TMR/CNT
	31	1	A0541261	COUNTER, CYCLE, LCD, TOTALIZER
	30	1	A0541259	TIMER, LCD, PRESET

20	2	A0541613	SCRW,ROUND HD,6-32,1/2" LG,BLK
19	1	A0541235	GRAPHIC, CONTROLLER
18	10ft	A0541258	CABLE, 6 COND, SHIELD
17	1	A0541262	NUT, LOCK, STRIAN RELIEF, 3/4"
16	1	A0541039	STRAIN RELIEF, 3/4"
15	1	A0536541	STRAIN RELIEF, PIGTAIL
14	1	W00012591	CORD, SET, W/PLUG, 9', 115V ONLY
13	1	A0541611	FUSE, 250V, MDL, 3/4 AMP
12	1	A0803495	FUSE, HOLDER
11	1	A0541233	GRAPHIC, STANDARD
10	1	A0536646	LIGHT, GREEN, NEON
9	2	W00014276	BOOT, RUBBER, TOGGLE SWITCH
8	1	A0541257	SW, TOGGLE, DPDT, ON-OFF-MOM
7	1	W00002540	SW, TOGGLE, SPST
6	1	A0541244	CONTROLLER, SPEED, STANDARD
5	1	W00020484	TERMINAL STRIP, 6 POSITION
4	1	A0534272	SOCKET, RELAY
3	1	A0503765	RELAY, DPDT
2	1	A0541253	PANEL, SUB, 8 x 6
1	1	A0541251	ENCLOSURE, 8 x 6 x 6, STANDARD
ITEM	QTY	PART NUMBER	DESCRIPTION
STANDARD BILL OF MATERIAL			

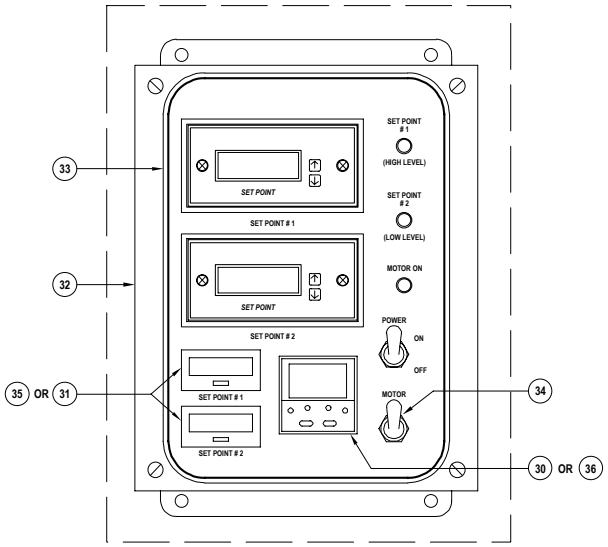
NOTE:

1) OPTIONAL ITEMS ARE SHOWN WITH A DASHED BOX.
2) ITEM #40 (NOT SHOWN ON DRAWING) TO BE FIELD INSTALLED.

Figure 11: Two Component Control Enclosure Parts Identification



DETAIL A
LEFT SIDE VIEW



DETAIL B
TIMER/CYCLE COUNTER OR
TIMER/ELAPSE TIME COUNTER

230V OPTION	50	1	A0544795	ASSEMBLY,TRANSFORMER,CNTL,230:115
EXTRUDER TRACKING OPTION (SEE #2)	41	2	A0541610	GRAPHIC, CONTROLLER, PERCENT
	40	2	A0541673	SENSOR,OPTICAL,PICKUP
TIMER/CYCLE COUNTER OR TIMER/ELAPSE TIME COUNTER OPTION (SEE DETAIL B)	38	1	A0505418	RELAY, SOCKET
	37	1	A0505417	RELAY, 4PDT
	36	1	A0541238	TIMER, SOCKET, 11 PIN
	35	2	A0541276	COUNTER, ELAPSE TIME, LCD
	34	1	W00014736	SW, TOGGLE, DPDT, 0N-OFF-ON
	33	1	A0541264	GRAPHIC, TMR/CNT
	32	1	A0541255	ENCLOSURE, 10 x 8 x 6, TMR/CNT
	31	2	A0541261	COUNTER, CYCLE, LCD, TOTALIZER
	30	1	A0541259	TIMER, LCD, PRESET

NOTE:
1) OPTIONAL ITEMS ARE SHOWN WITH A DASHED BOX.
2) ITEM #40 (NOT SHOWN ON DRAWING) TO BE FIELD INSTALLED.

22	1	A0536225	SW,PROX,NO,CAP,18MM,CAO010VCSN
21	1	A0536549	STRF,HEYCO,18-2,1150
20	4	A0541613	SCRW,ROUND HD,6-32,1/2" LG,BLK
19	2	A0541235	GRAPHIC, CONTROLLER
18	10ft	A0541258	CABLE, 6 COND, SHIELD
17	1	A0541262	NUT, LOCK, STRAIN RELIEF, 3/4"
16	1	A0541039	STRAIN RELIEF, 3/4"
15	1	A0536541	STRAIN RELIEF, PIGTAIL
14	1	W00012591	CORD, SET, W/PLUG, 9', 115V ONLY
13	1	A0541611	FUSE, 250V, MDL, 3/4 AMP
12	1	A0803495	FUSE, HOLDER
11	1	A0541263	GRAPHIC, DUAL SET POINT
10	3	A0536646	LIGHT, GREEN, NEON
9	2	W00014276	BOOT, RUBBER, TOGGLE SWITCH
8	1	A0541257	SW, TOGGLE, DPDT, ON-OFF-MOM
7	1	W00002540	SW, TOGGLE, SPST
6	2	A0541244	CONTROLLER, SPEED, STANDARD
5	1	W00020484	TERMINAL STRIP, 6 POSITION
4	2	A0534272	SOCKET, RELAY
3	2	A0503765	RELAY, DPDT
2	1	A0541256	PANEL, SUB, 10 x 8
1	1	A0541254	ENCLOSURE, 10 x 8 x 6
ITEM	QTY	PART NUMBER	DESCRIPTION
STANDARD BILL OF MATERIAL			

7-6 Returned Material Policy

Credit Returns

Prior to the return of any material **authorization** must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

ALL returned material purchased from **the manufacturer** returned is subject to 15% ($75.00 minimum) restocking charge.

ALL returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, authorization must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given, at **the manufacturer's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by our company**,** purchased components are covered under their specific warranty terms.

7-7 Safety Tag Information

Additive Feeder Safety Tags

Read Operation and Installation Manual

Shear Hazard Rotating Auger

High Voltage Inside Enclosure

Earth Ground

Lifting Point

PE **Protected Earth Ground**

7-8 Additive Feeder Identification (Serial Number) Tag

(Located on back of Additive Feeder)

Company Logo

CE

XX-X Series Additive Feeder
Model Number XX-X
Max Blend Capacity 318 KG/HR

220V **Serial Number 060701R**
1Ø **Date of Manufacture 06/2004**
4.5A
Over-current Protection Device (s) 4.5A Total
Frequency 50/60Hz
Compressed air supply 4.14 bar (60 psi)
Auger Speed 16 RPM
Feeder Mass 400 lbs/(180 KG)
Electrical Diagrams & Pneumatic Diagram

Street Address **City, State Zip Code**
Telephone Number

7-9 Technical Assistance

Parts Department

Call toll-free 7am–5pm CST [800] 423-3183 or call [630] 595-1060, Fax [630] 475-7005
The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

Service Department

Call toll-free 8am–5pm CST [800] 233-4819 or call [630] 595-1060
Emergencies after 5pm CST, call [847] 439-5655
We have a qualified service department ready to help. Service contracts are available for most products.

Sales Department

Call [630] 595-1060 Monday–Friday, 8am–5pm CST
Our products are sold by a world-wide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Contract Department

Call [630] 595-1060 Monday–Friday, 8am–5pm CST
Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.

Worksheet for Charting Feed Rates

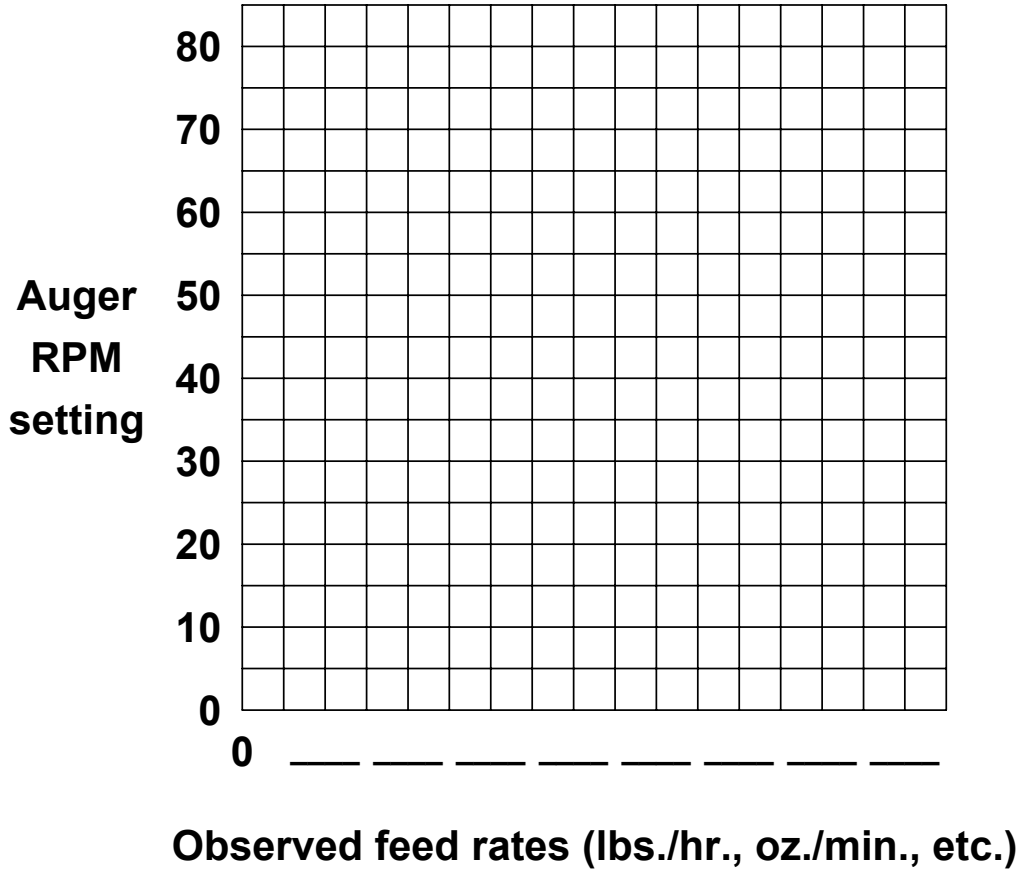
Material _____

Auger size _____

Feed rate unit of measure _____

Trial #1 rpm _____ Feed rate _____

Trial #2 rpm _____ Feed rate _____



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